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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,369	05/18/2005	Hendrik Klaas Louwsma	1217/214	9352
46852	7590	02/10/2009		
LIU & LIU 444 S. FLOWER STREET, SUITE 1750 LOS ANGELES, CA 90071				
EXAMINER				
RAINEY, ROBERT R				
ART UNIT		PAPER NUMBER		
2629				
MAIL DATE		DELIVERY MODE		
02/10/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/535,369

Applicant(s)

LOUWSMA ET AL.

Examiner

ROBERT R. RAINEY

Art Unit

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-33 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 14-33 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 18 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. The 112 rejections raised in the previous office action are rendered moot by the cancellation of the rejected claims.
2. The objection to the drawings under 37 CFR 1.83(a) in the previous office action is rendered moot by the cancellation of the claim containing the features not shown.
3. Examiner withdraws the objection to the drawings raised in the previous office action regarding unlabelled rectangular boxes. To provide information that applicant asked for in traversing the objection examiner notes:

37 CFR 1.83(a) states that where detailed illustration is not essential a labeled representation such as a labeled rectangular box may be used. "labeled" has been interpreted by the office to mean "descriptive text labels" see examiner note 1 to form paragraph 6.22 in the MPEP. Note also that 37 CFR 1.84(n) says that a symbol may be used only if it is readily identifiable and 37 CFR 1.84(o) provides that legends may be required by the examiner where necessary for understanding of the drawing. PCT Rule 11.11 regarding words in drawings is not incompatible with the interpretation of the office. Examiner recommends to applicant "Guide for the Preparation of Patent Drawings" available at <http://www.uspto.gov/web/navaids/siteindx.htm>.

Examiner concludes that the items represented by unlabeled rectangular boxes are of a conventional nature and thus do not strictly require labels in order to be understood.

4. The objection to claim 1 for a misspelled word is rendered moot by the cancellation of the claim.

5. Applicant's arguments filed 9/8/2008 regarding the applicability of cited art to the newly submitted claims have been fully considered but they are not persuasive. Applicant states, at page 9 as a conclusion without support, that neither Ishii nor Matsueda teach a selection driver. The rejections of the new claims below indicate that the recited selection driver is indeed taught. At page 10, applicant argues that the teachings of Ishii do not apply because Ishii teaches control of RGB elements and that control of RGB level is somehow different from the gray level control in the instant application. Examiner disagrees and is surprised that applicant would seek to describe applicant's invention as not being applicable to color displays. Especially since at least at 3:4-15 and 16:11 applicant's disclosure describes the invention in terms of "color gray-values". Also Ishii says in its abstract that the invention concerns the generation of "gray-shades" and so does have applicability to gray level control. Applicant argues that the control provided by Ishii isn't the same as controlling gray level without flickering. First, flickering is not a term found in the claims. Second, Ishii directly states that it is known in the art that "Liquid crystal displays have a number of well known characteristics which must be overcome by the associated controller. One characteristic

is that if the various display pixels (picture elements) are excited so that adjacent picture elements are excited in the same phase, undesirable visual artifacts appear, degrading the quality of the resulting image. These artifacts include visual **flickering**, and a streaming motion. Frame Rate Control (FRC), **which involves introduction of a phase shift for excitation of adjacent pixels** in certain types of LCD controllers, is one technique for reducing certain of the aforementioned characteristics.". And also that "The result of FRC is commonly referred to as grayscale or grayshades images but it is to be understood that such terms refer also color images in addition to black and white images." Ishii 4:34-37. This seems very like the sense of gray level given in the instant application. If applicant is arguing for a special definition of gray level control then applicant should embody the special features in the claims or point out where in the specification an explicit redefinition of terms occurs.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. **Claims 23, 24, 26, and 28** rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As to **claim 23**, the specification as filed teaches increase/decrease of phase by 1 at certain times but does not mention this with respect to adjacent picture elements. While the specification as filed (at page 11:25-26 or [0048]) does teach that adjacent picture elements are addressed out of phase, it does not mention that this difference is 1.

As to **claim 24**, the specification as filed (at page 11:25-26 or [0048]) teaches adjacent picture elements having substantially the same gray level but "same gray level" is more narrow than "substantially the same gray level" and is therefore new matter.

As to **claim 26**, the specification as filed refers to non-sequential selections of time periods in claim 4 and "non-sequential selections of time periods within a sequence of time periods" (at page 2:20-21,30 or [0011] and [0014]) but does not mention "non-sequential driving of picture elements".

As to **claim 28**, the specification as filed (at page 2:31-32 or [0015]) states "In this case preferably (s-1) increases (or decreases) of the number of selections within a sequence of selections are allotted to one time period only. Said time period may comply with a frame period in which a sequence of time periods is a sequence of frame periods." This is the only place that refers to

"number of selections within a sequence of selections". It does not refer to increases or decreases in the gray levels being "limited to number of selections within a sequence of selections" at all, let alone for one time period only.

8. **Claims 14-20, 22, 23, and 29-33** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,362,834 to *Ishii* ("*Ishii*").

As to **claim 33**, *Ishii* discloses A display device comprising: an array of picture elements defined at areas of crossings of selection electrodes and data electrodes (the construction of passive matrix displays, mentioned at for example column 1 lines 25-28, as claimed was well known to those skilled in the art at the time of the invention and the existence of selection and data electrodes, selection and data electrodes are further implied at column 7 lines 1-4 especially "column and row counters" since column and row define a crossing matrix and were known in the art to carry data and selection signals respectively, in the most common convention, and the alternative mapping was also known); a data driver driving the data electrodes in accordance with an image to be displayed at the picture elements (see for example column 1 lines 27-32, *Ishii* does not explicitly mention separate data drivers but this would have been fairly suggested to one of ordinary skill in the art at the time of the invention); a selection driver providing selection signals to selection electrodes to drive the associated picture elements (see for example column 1 lines 27-32, *Ishii* does not explicitly mention separate

selection drivers but this would have been fairly suggested to one of ordinary skill in the art at the time of the invention), wherein the selection driver drives a group of adjacent picture elements to display a same gray level during a selection time (while Ishii does not limit its teachings to displaying the same gray level in adjacent picture elements it would have been obvious to one skilled in the art that this could be done and often was as evidenced by the "blue screen of death" displayed when a system running a Microsoft operating system experienced an unrecoverable error), wherein the selection driver drives each picture element within the group by switching on/off state of each picture element within a sequence of consecutive frame periods during the selection time (see for example column 1 line 39, which describes the use of "Frame Rate Control", which is well known in the art, as evidenced by the instant application publication [0004] - [0006], to include consecutive frame periods in a super-frame, which corresponds to a "selection time" in the instant application), and wherein phase of said sequence of consecutive frame periods is shifted for adjacent picture elements within the group (see for example column 1 lines 39-42, "Frame Rate Control (FRC), which involves introduction of a phase shift for excitation of adjacent pixels ...").

Claim 14 claims a subset of the limitations of claim 33 and is rejected on the same grounds and arguments.

As to **claim 15**, in addition to the rejection of claim 14 over Ishii, Ishii further discloses a passive matrix type display and it was known in the art that a type of passive matrix display is one in which the selection electrodes and data electrodes are respectively supported on opposing substrates and it would have been obvious to use such a known type of display.

As to **claim 16**, the rejection of claim 14 already covered the limitation that the sequence of consecutive time periods is a sequence of consecutive frame periods.

As to **claim 17**, in addition to the rejection of claim 14 over Ishii, Ishii may not explicitly disclose that the selection driver, during each time period, sequentially drives the picture elements within the group during the selection time.

Examiner takes official notice that sequential driving of picture elements during a frame, i.e. time period, was well known to those skilled in the art at the time of the invention. In fact sequential scanning of the rows, i.e. as driven by the selection driver, was and is so common that it is most often noted only when not employed.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use an art recognized scanning scheme.

As to **claim 18**, the limitation that the selection driver sequentially provides the selection electrodes of the group of picture elements during the selection time with selection signals to sequentially drive the picture elements was already implicit in the rejection of claim 17 since supplying selection signals is what a selection driver inherently does.

As to **claim 19**, in addition to the rejection of claim 18 over Ishii:

Ishii does not expressly disclose that the selection driver provides mutually orthogonal selection signals to the selection electrodes for the group of picture elements to drive the picture elements.

Applicant's admitted prior art discloses selection drivers that provide mutually orthogonal selection signals to the selection electrodes for the group of picture elements to drive the picture elements (see for example [0003] of the publication of the instant application).

Ishii and Applicant's admitted prior art are analogous art because they are from the same field of endeavor, which is liquid crystal displays.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the device of *Ishii* to include the multi-row orthogonal vector drive scheme as disclosed by Applicant's admitted prior art. The suggestion/motivation would have been to provide advantages such as to avoid the phenomenon of frame response or to realize a high number of lines (see for example [0003] of the publication of the instant application).

As to **claim 20**, in addition to the rejection of claim 17 over Ishii, Ishii further discloses that different voltages are applied to the data electrodes during sub-selection times of the selection time (As covered in the citations for the parent claims, Ishii teaches using multiple frames within a super-frame or in the language of the claim multiple sub-selection times within a selection time in order to generate a particular gray scale. Since during some of the frames a pixel is off and during some it is on the voltages applied to the data electrodes must have been different in the different frames.).

As to **claim 22**, in addition to the rejection of claim 14 over Ishii, Ishii further discloses that the phase of the sequence of consecutive time periods is altered after each sequence of consecutive time periods (see for example 6:9-30; note that a change after each FRC cycle, i.e. frame rate control cycle or super-frame or sequence of consecutive time periods, is included in the table as one possibility).

As to **claim 23**, in addition to the rejection of claim 22 over Ishii, Ishii further discloses that the phase of the sequence of consecutive time periods is increased or decreased by one time period between adjacent picture elements (see for example Figure 3(a) in which the phase of adjacent picture elements differs by 1).

As to **claim 24**, the limitation that the group of picture elements are driven to display a same gray level was covered in the rejection of claim 33 which was also cited as the rejection for claim 14 from which claim 24 depends.

As to **claim 29**, the limitations that the sequence of consecutive time periods is a sequence of consecutive frame periods, and wherein the phase is changed during selection of subsequent sequences of frame periods were covered in the rejection of claim 33 upon which the rejection of claim 14, from which claim 29 depends, was based.

As to **claim 30**, in addition to the rejection of claim 14 over Ishii, Ishii further discloses that the number of selection electrodes is p ($p \geq 1$) (see citations for claim 14 note that in order to function the display must have at least one selection electrode).

As to **claim 31**, in addition to the rejection of claim 30 over Ishii, Ishii does not explicitly disclose that $p = 1$, but such an implementation would have been fairly suggested to one of ordinary skill in the art at the time of the invention (while Ishii does not limit its invention to a single selection electrode one of ordinary skill at the time of the invention would have recognized that a display could be made with any number of rows from 1 to as high a number as desired;

therefore a display with only one row would have been obvious), and wherein different voltages are provided to the data electrodes at sub-selection times of the selection time (As covered in the citations for the parent claims, Ishii teaches using multiple frames within a super-frame or in the language of the claim multiple sub-selection times within a selection time in order to generate a particular gray scale. Since during some of the frames a pixel is off and during some it is on the voltages applied to the data electrodes must have been different in the different frames.).

As to **claim 32**, in addition to the rejection of claim 30 over Ishii, Ishii does not explicitly disclose that $p = 4$, but such an implementation would have been fairly suggested to one of ordinary skill in the art at the time of the invention (while Ishii does not limit its invention to four selection electrodes, one of ordinary skill at the time of the invention would have recognized that a display could be made with any number of rows from 1 to as high a number as desired; therefore a display with four rows would have been obvious).

9. **Claims 21 and 25-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,362,834 to Ishii ("*Ishii*") and further in view of U.S. Patent No. 6,198,469 to Tjandrasuwita ("*Tjandrasuwita*").

As to **claim 21**, in addition to the rejection of claim 17 over Ishii:

Ishii may not expressly disclose that sub-selection time-phase is changed during selection of a sub-selection time in subsequent sequences of selection times.

Tjandrasuwita discloses a frame-rate modulation method and in particular that sub-selection time-phase is changed during selection of a sub-selection time in subsequent sequences of selection times (see for example Fig. 6, 9 and column 13 line 64 to column 14 line 20 and column 14 line 37 to column 17 line 7; note especially column 14 lines 60-67 "...the frame offset value, the horizontal pixel offset value, the vertical line offset value, and the color offset values are used as variables in determining the waveform accessing index..." which is the WAVEFORM INDEXs of Fig. 6, which indexes determine the phasing of the waveforms. Since the frame offset, i.e. sub-selection time offset, is used as an input the phase is changed during selection of a sub-selection, i.e. frame.).

Matsueda, Ishii and Tjandrasuwita are analogous art because they are from the same field of endeavor, which is liquid crystal displays.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to include a change of time-phase during selection of a sub-selection time in subsequent sequences of selection times as taught by *Tjandrasuwita* in the device after *Matsueda* and *Ishii*. The suggestion/motivation would have been to provide advantages such as to prevent screen flickering (see for example *Tjandrasuwita* column 15 lines 1-7).

As to **claim 25**, in addition to the rejection of claim 14 over Ishii:

Ishii may not expressly disclose a grayscale table for generating gray level data, wherein sequences of sequential gray levels are defined by grouping plurality of sequential gray levels.

Tjandrasuwita discloses a frame-rate modulation method and in particular: a grayscale table (see for example TABLE 2 and column 11 line 52 to column 12 line 11, in which "brightness-level waveforms" corresponds sequences) wherein sequences of sequential gray levels are defined by grouping plurality of sequential gray levels (see for example Table 2, which shows a table with 17 sequences of sequential gray levels, each sequence has 16 sequential gray levels, that is the gray levels follow each other in sequence),

Ishii and *Tjandrasuwita* are analogous art because they are from the same field of endeavor, which is liquid crystal displays.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to use a grayscale table as taught by *Tjandrasuwita* in the device after *Ishii*. The suggestion/motivation would have been to provide advantages such as a cost effective modulation apparatus (see for example column 2 lines 26-28) or the ability to program gray level data sequences according to the requirements of the panel (see for example column 12 lines 1-11).

As to **claim 26**, in addition to the rejection of claim 25 over Ishii and *Tjandrasuwita*:

Ishii and *Tjandrasuwita* does not expressly disclose that sequences of sequential gray levels are applied to non-sequential driving of picture elements within the sequence of consecutive time periods.

Examiner takes official notice that non-sequential, or in other words random-access, driving of picture elements was well known to those skilled in the art at the time of the invention. While employed less frequently because it generally lowers overall refresh rates, random-access driving was known to be used for relatively static displays in which only a limited number of pixels were changing. Non-sequential driving was also known to be used by another name: interlaced driving. In that case the pixels are not addressed sequentially but every other row is skipped.

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ the known technique of non-sequential driving with the invention after Ishii and *Tjandrasuwita* in order to address known display issues or implement known display types.

As to **claim 27**, in addition to the rejection of claim 26 over Ishii and *Tjandrasuwita*, Ishii and *Tjandrasuwita* further discloses that displayed gray levels are increased or decreased by selections from the grayscale table corresponding to a sequence of gray levels (see for example Table 2 in which the

sequence of gray levels comprises 17 items from 0/16 to 16/16 the particular sequence desired is selected from this sequence of gray levels, see for example 12:43-50 and Fig. 6; increased or decreased displayed gray levels are achieved by selecting increased or decreased gray level generating sequences from among the 17 sequences).

As to **claim 28**, in addition to the rejection of claim 27 over Ishii and *Tjandrasuwita*, *Tjandrasuwita* further discloses that increases or decreases of display gray levels is limited to number of selections within a sequence of selections for one time period only (see for example Table 2 and 12:43-50 and Fig. 6, note that decisions to increase or decrease the display gray level occur during a single time period, that being either during the first or last time period, i.e. frame, of an FRC cycle).

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT R. RAINEY whose telephone number is (571)270-3313. The examiner can normally be reached on Monday through Friday 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amare Mengistu can be reached on (571) 272-7674. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/RR/

/Amare Mengistu/

Supervisory Patent Examiner, Art Unit 2629